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MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

DIVISION OF FORESTRY

INSECT AND DISEASE REPORT

Missoula, Montana 59801
Report 78-2

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FOREST INSECT AND DISEASE CONDITIONS IN MONTANA--1977

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by

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Great potential exists in Montana for increasing timber production and for preserving forests for recreational and aesthetic uses by reducing damage and tree losses caused by forest pests. Under the Insect and Disease Control Program, responsibilities of the Division of Forestry of the Department of Natural Resources and Conservation fall into four basic areas:

1. Encouraging the use of preventive measures of demonstrated effectiveness on State and private forest lands as the first line of defense against destructive insects and diseases.

2. Operating a detection program with surveys of sufficient intensity and frequency to ensure prompt discovery of forest insect and disease outbreaks on State and private lands.

3. Providing for thorough biological, cost benefit, and environmental impact evaluations of insect and disease outbreaks on State and private forest lands as a basis for deciding for or against suppression.

4. Practicing and encouraging the use of effective means of forest insect and disease control which provide the least potential hazard to man, domestic animals, wildlife, and other components of the natural environment.

PROGRAM ACCOMPLISHMENTS IN 1977

1. The annual cooperative aerial insect and disease detection survey was conducted on a total of 2,134,400 acres of forest lands, including private commercial ownerships, and the Swan River, Stillwater, and Thompson River State forests. Insect and disease infestations were mapped, and copies of the completed maps were made available to the U.S. Forest Service and the Division of Forestry area offices.

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2. Over 50 field detection reports and damage samples were received from Division field personnel and private landowners for identification and recommendations.

3. An evaluation of western spruce budworm infestations on 843,920 acres of State and private lands was completed.

4. Work toward developing methods for predicting larval populations of Douglasfir tussock moths from numbers of adult male moths caught in pheromone-baited sticky traps was continued. In 1977, four different pheromone concentrations were tested on each of eight plots in the Missoula and Flathead valleys.

5. A study to determine the effectiveness of cacodylic acid herbicide in causing mountain pine beetle brood mortality was completed. Effects on beetle brood mortality were assessed in the spring of 1977 and compared to the 1976 results. The study will be reported in Insect and Disease Report 78-3.

6. A detection survey for the smaller European elm bark beetle (the vector of Dutch elm disease) was conducted in nine Montana cities using sticky traps baited with Multilure pheromone. The results of that survey were presented in Insect and Disease Report 78-1, Detection Survey for the Smaller European Elm Bark Beetle in Montana Using Pheromone-Baited Sticky Traps.

REVIEW OF CONDITIONS

Bark Beetles

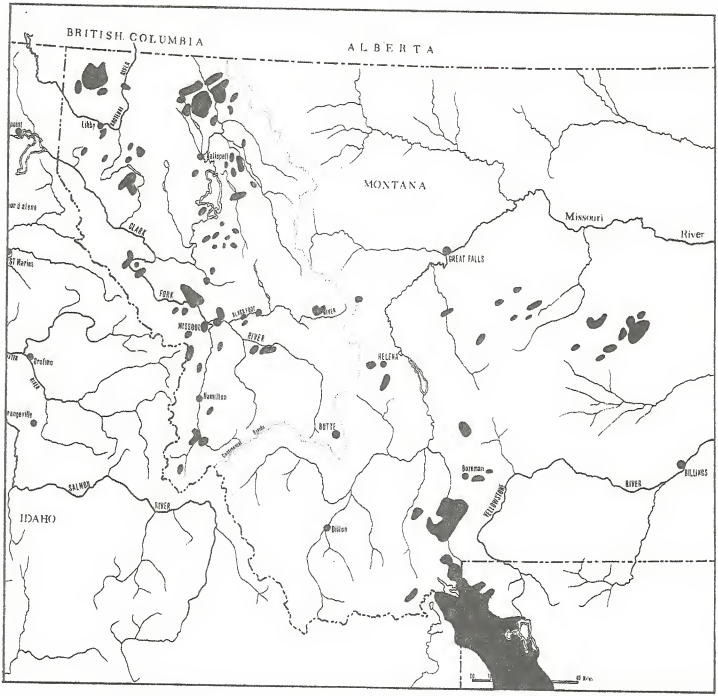
Mountain Pine Beetle, *Dendroctonus ponderosae* (Hopk.)

Infestation levels remained high with substantial increases in many mature lodgepole pine stands and overstocked second-growth ponderosa pine stands (Figure 1).

Heavy mortality in lodgepole pine continued in the Gallatin River drainage south of Bozeman. Approximately 146,000 acres are currently infested, at an average of over 30 trees per acre. Since 1969, over 350 million board feet of timber in the Gallatin River drainage have been killed by mountain pine beetles; over 4 million trees could be killed in 1978. The buildup ratio of 1976 to 1977 attacked trees was 1:2.8.

The mountain pine beetle-infested area around West Yellowstone and Hebgen Lake reached 78,000 acres in 1977. The buildup ratio of trees killed in 1976 to trees killed in 1977 was 1:8. Approximately 1.7 million trees containing 175 million board feet of timber are currently infested. Predictions are that over 3 million trees will be killed on approximately 130,000 acres in 1978.

Beetle activity increased markedly in the North Fork drainage of the Flathead River in 1977. Currently infested in Glacier National Park are 142,300 acres, and in the Coal Creek State Forest area 10,215 acres of national forest lands, 13,470 acres of private lands, and 3,915 acres of State-owned lands are infested. Losses of timber to date on these lands total 284,419,600 cubic feet. The buildup ratio of trees killed in 1976 to trees killed in 1977 was approximately 1:7. Substantial increases in both number of acres infested and number of trees killed are expected in 1978.


BRITISH COLUMBIA
ALBERTA
MONTANA
Missouri
River
GREAT FALLS
HELENA
BUTTE
Dillon
Bozeman
YELLOWSTONE
RIVER
BILLINGS
Missoula
Kalispell
Libby
Hamilton
Deer Lodge
Dillon
Salmon
IDAHO
CLARK
FORK
ALBERTA
RIVER
BITTERROOT
SALMON
RIVER
Kootenai
Pend Oreille
Flathead
Lake
Lake
Lake

Losses continued in lodgepole pine on State, private, and Federal lands in the Meadow Creek, Lazier Creek, and Thompson River drainages north of Thompson Falls. Beetle activity continued to increase near Fish Trap Lake and in Twin Lakes Creek and Fish Trap Creek drainages. The infestation now covers approximately 3,000 acres.

In the Bitterroot River drainage, an infestation on the north face of Shook Mountain covered approximately 1,200 acres in 1977, and over 103,000 lodgepole and ponderosa pines, containing 4,326,520 board feet were killed. Approximately 1,100 ponderosa pines were killed near Sulu in the Cameron Creek drainage and near the East Fork of the Bitterroot River, largely on State and private lands.

Over 1 million lodgepole pines were killed in 1977 in the Jack Creek infestation east of Ennis, which now covers over 4,000 acres.

In the Upper Yaak River drainage north of Libby, the mountain pine beetle outbreak on predomonantly U.S. Forest Service lands covers approximately 13,000 acres.

Continued ponderosa pine losses to mountain pine beetles occurred on State, private, and Federal lands in the Lewistown area. Tree killing increased in the Moccasin and Little Snowy mountains, in Maiden Canyon in the Judith Mountains, and in Big Spring, Castle, Casino, Beaver and Rock Creek drainages of the Big Snowy Mountains. Continued activity was noted in McCartney and Flatwillow Creek drainages.

Some losses have occurred in second-growth ponderosa pine stands on the Fort Belknap Indian Reservation in the Little Rocky Mountains. Current infestation levels average 7.1 trees per acre, and an estimated 4,560 trees have been killed since 1975.

Losses in ponderosa pine continued in the Blackfoot River and Clark Fork drainages. Beetle activity persisted north of Potomac, near Greenough in the Fish Creek drainage, in the Bearmouth area, and in Johnson and Butler Creek drainages northwest of Missoula.

Approximately 3,300 ponderosa pines were killed in the Wolf Mountains near Lodge Grass on the Crow Indian Reservation.

A mountain pine beetle outbreak of approximately 10 acres on State lands occurred next to log decks at the American Timber Products mill in Olney, apparently the result of beetles flying from infested logs decked in the yard to trees in the adjacent stand of lodgepole pine.

Douglasfir Beetle, Dendroctonus pseudotsugae (Hopk.)

As in past years, activity by this beetle remained generally low throughout the State. Scattered groups of overmature Douglasfir were killed.

Pine Engraver Beetle, Ips sp.

Damage by pine engraver beetles increased substantially in 1977, probably due to drought conditions that prevailed during the year causing stress in the trees and making them more susceptible to attack. Activity occurred mostly in ponderosa pine, with losses occurring near Missoula on Blue Mountain in Rattlesnake, Grant,

O'Brien, and Lolo Creek drainages; along the Clark Fork near Bonner, Turah, and Big Flat on both sides of the Bitterroot Valley; and in several areas of the Flathead Valley, including Polson, Rollins, and Pablo. Damage due to engraver beetles was intensified by disturbance to tree root systems through road building and home construction in the Blue Mountain, Grant Creek, and Rattlesnake Creek areas, with some losses of high-value shade trees occurring.

Spruce Beetle, Dendroctonus rufipennis (Kirby)

Beetle-containing spruce blowdown remaining from 1976 in the Antice area of the Stillwater State Forest, as well as 1977 blowdown, was largely removed through salvage. Prompt removal of down spruce through such salvage has prevented outbreaks in standing trees.

Fir Engraver, Scolytus ventralis (LeConte)

Activity in Douglasfir by fir engraver declined in 1977. Surveys in 1978 may detect increases in the number of trees killed as a result of low rainfall during 1977. Fir engraver activity has occurred in the lower Thompson River drainage; near Olney, Whitefish Lake, Lake Blaine, and Echo Lake in the Kalispell area; around Swan Lake; and in the Lost, Soup, Cilly, and Goat Creek drainages in the Swan River State Forest.

Defoliators

Western Spruce Budworm, Choristoneura occidentalis (Freeman)

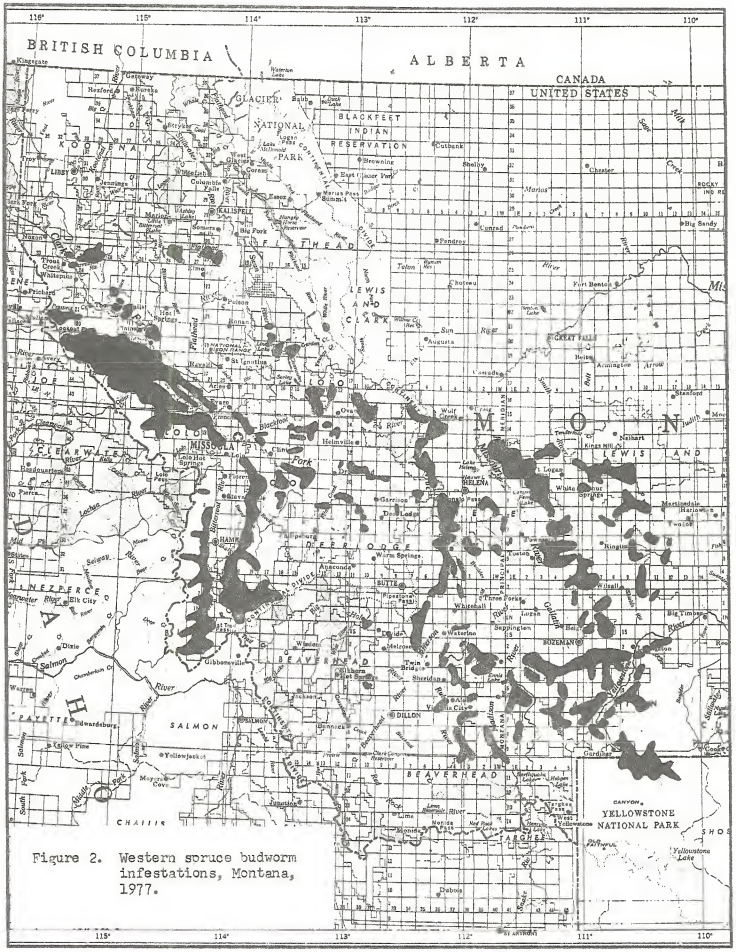
Visible defoliation in Montana was detected on 2,992,655 acres of Douglasfir, true fir, and spruce in 1977 (Figure 2), a 20-percent increase over the 2,496,274 acres defoliated in 1976. Increases in the number of acres defoliated occurred in the Bitterroot, Custer, Gallatin, Helena, Kootenai, Lewis & Clark, and Lolo national forest areas and within the Flathead Indian Reservation. Defoliated acreages decreased in the Beaverhead, Deer Lodge, and Flathead national forest areas.

Douglasfir Tussock Moth, Orgyia pseudotsugata (McD.)

No defoliation from Douglasfir tussock moth was detected in Montana in 1977. Moth populations remained low. No larvae were recovered from lower branch beating samples on eight study plots in the Missoula and Flathead valleys, even though several hundred trees were sampled and adult male moths were caught in pheromone-baited sticky traps at all of the plot locations.

Larch Casebearer, Coleophora laricella (Hbn.)

Defoliation from larch casebearer increased in 1977; the most severe damage was detected in low-elevation stands. In the Flathead National Forest area, there were 23,196 acres of State and private lands and 56,599 acres of Federal lands defoliated. There were 27,600 acres of defoliation on the Flathead Indian Reservation.


BRITISH COLUMBIA
ALBERTA
CANADA
UNITED STATES
GLACIER NATIONAL PARK
BLACKFEET INDIAN RESERVATION
KOOTENAI
FLATHEAD
LEWIS AND CLARK
MISSOULA
HELENA
BUTTE
BOZEMAN
DILLON
GREAT FALLS
YELLOWSTONE NATIONAL PARK
CANYON
SALMON
BEAVERHEAD
JEFFERSON
GALLATIN
MADISON
CHAFFIN
LINCOLN
SANDERS
MINERAL
CLEARWATER
IDAHO
LEMHI
LIMA
Dubois
Yellowstone Lake
Fishtrap
Big Sandy
Chester
Shelby
Cutbank
Conrad
Fort Benton
Lewistown
Stanford
Denton
Kings Hill
Belt
Lewis and Clark
Helena
Townsend
Boulder
Whitehall
Three Forks
Bozeman
Big Timber
Livingston
Gardiner
Ennis
Dillon
Salmon
Dixie
Edwardsburg
Yellowjacket
Cobalt
Kingsgate
Eureka
Libby
Troy
Bonner
Missoula
Superior
Plains
Thompson Falls
Kalispell
Whitefish
Polson
Ronan
Pablo
Dayton
Cut Bank
Shelby
Chester
Conrad
Choteau
Augusta
Simms
Stanford
Lewistown
Roundup
Harlowton
Ringling
Wilsall
Belgrade
Manhattan
Gallatin Gateway
Ennis
Sheridan
Twin Bridges
Melrose
Wisdom
Jackson
Wisdom
Lima
Dubois
Lincoln
Helmville
Ovando
Seeley Lake
Superior
Plains
Thompson Falls
Noxon
Troy
Libby
Eureka

Other Insects

Pine Bark Aphid, Pineus sylvestris (Annand)

Approximately 300 acres of Scotch pine Christmas tree plantations in the Kalispell, Big Fork, and Whitefish areas were affected. New growth was stunted, resulting in "hour-glass" shaped trees not suitable for marketing. Because plantation owners had to start reshaping the trees through shearing, several years growth was lost on many trees. Damage was detected too late in 1977 to attempt control, but should populations persist in 1978, suppression by aerial spraying of insecticide may be initiated by the landowners.

Ponderosa Pine Needle Miner, Coleotechnites sp.

Approximately 10,000 acres of ponderosa pine were damaged on the Flathead Indian Reservation near Arlee. A grove of ponderosa pines on the University of Montana Campus, Missoula, was also affected.

Diseases

Fir-Fireweed Rust, Pucciniastrum epilobii (otth.)

This disease affected scattered subalpine fir on several thousand acres between upper Antice Creek and Upper Whitefish Lake. The damage was heavier near Antice Creek.

Pine Needle Cast Fungus, Lophodermella concolor (Dearn.) Darker

Damage occurred on several thousand acres of lodgepole pine in the Fitzsimmons Creek drainage and in the upper Stillwater River drainage of the Stillwater State Forest. Lodgepole pines were also damaged in a large area between Lincoln and Rogers Pass, with some mortality to small regeneration. Heavy damage was also noted in Gory Creek and Nickel Bar Gulch of the Ruby Creek drainage, southwest of Wisdom.

Dutch Elm Disease, Ceratocystis ulmi (Buism.) C. Moreau

Dutch elm disease fungus was recovered from dead and dying American elms south of Florence, Ravalli County, in 1977. So far, the disease is restricted to this locality and Missoula.

To determine the general distribution in Montana of the principal vector of the disease, the smaller European elm bark beetle, Scolytus multistriatus (Marsham), nine cities were surveyed using pheromone-baited sticky traps. Beetles were recovered from traps in Billings, Great Falls, Livingston, Bozeman, Miles City, Glendive, and Kalispell. No beetles were trapped in Lewistown or Sidney. Dutch elm disease has not been detected in any of the cities where populations of elm bark beetles occur, but it is probably just a matter of time before the disease spreads to elms in these cities.